

*Maxima and Minima of Variable Stars Observed during the Years 1889, 1890, and 1891.* By John Mitchell.

The following results have been derived from observations made with an achromatic of 3·5 inches aperture, using constantly an eyepiece of low power.

The mode of observation has been to compare the variable with stars differing little from it in brightness, and whose magnitudes had been kindly supplied to me by Mr. Baxendell, who, I believe, determined some of them himself, and obtained the remainder from his late father and the late Mr. Pogson.

*R Cygni.*

Maximum: 1889 Oct. 9; mag. 7·1

*S Ursæ Majoris.*

Maximum: 1889 Sept. 15; mag. 7·6

Minimum: 1890 Jan. 1; „ 12·35

Maximum: 1890 Apr. 18; „ 7·6

Minimum: 1890 Aug. 20; „ 12·25

Minimum: 1891 Apr. 2±; „ ?

Maximum: 1891 July 13; „ 7·75

Minimum: 1891 Nov. 10; „ 12·45

*T Ursæ Majoris.*

Maximum: 1890 June 3; mag. 7·1

Maximum: 1891 Nov. 1; „ 7·85

Observations have been made as follows:—

*R Cygni. U Geminorum. S Ursæ Majoris. T Ursæ Majoris.*

| In 1889 | 30 nights. | ...        | 26 nights. | 13 nights. |
|---------|------------|------------|------------|------------|
| „ 1890  | 26 „       | ...        | 40 „       | 31 „       |
| „ 1891  | 30 „       | 12 nights. | 58 „       | 42 „       |

*Brockholes, Huddersfield:*  
1892 February 25.

*Occultation of  $\gamma_1$  and  $\gamma_2$  Virginis.* By the Rev. A. Freeman.

The disappearances of these stars took place January 19, 1892, a little east of the south point of the bright limb of the Moon. The star  $\gamma_1$  Virginis disappeared at  $16^h 2^m 53^s.8$ , G.M.T., the star  $\gamma_2$  at  $16^h 3^m 12^s.3$ . Dense cloud unfortunately prevented the observation of the reappearances at the dark limb about one hour later. I employed a  $6\frac{1}{2}$ -inch O.G. with a power of 90. Each star took from 2·5 to 3 seconds, after projection within the limb of the Moon as a bright round point, before it finally disappeared; a separate less bright segment of a star was in each case seen just outside the limb. The times recorded refer to the disappearances of these segments, which were simultaneous with those of the projected stars. I consider that, in this case, the apparent effect of projection was due to the fact that perfect achromatism is impossible with an object-glass composed of two lenses only. The principal rays of light collected by the object-glass in a common focus give the bright star image as seen apparently within the limb, but the apparent diameter of the Moon is enlarged by imperfect achromatism, and the segments of stars are parts of uncorrected images out of focus. The line joining the two stars seemed to the eye inclined about  $25^\circ$  from the normal to the Moon's limb,  $\gamma_2$  being east of the normal at the disappearance of  $\gamma_1$ . From the Greenwich Ten-Year Catalogue for 1880 I find the mean places of the stars for  $1892^\circ$  would be:—

|                       | <sup>h</sup> | <sup>m</sup> | <sup>s</sup> |                              |
|-----------------------|--------------|--------------|--------------|------------------------------|
| $\gamma_1$ Virg. R.A. | 12           | 36           | 11·122       | S.D. ${}^{\circ} 51' 22''73$ |
| $\gamma_2$ Virg. R.A. | 12           | 36           | 11·296       | S.D. ${}^{\circ} 51' 28''10$ |

Annual precession, secular variation, and proper motion are the same for both stars. Hence the position angle of  $\gamma_2$ , referred to  $\gamma_1$ , would seem to be  $154^\circ 4'75$ , and its distance  $5''97$ . I judged  $\gamma_1$  to be the brighter of the two stars. The approximate position of my observatory is in lat.  $51^\circ 20' N.$ , long.  $3^m 0^s E.$

*Murston Rectory, Sittingbourne :*  
1892 March 7.